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THE IMPLEMENTATION OF BRAIN BASED LEARNING TO IMPROVE STUDENT LEARNING OUTCOMES IN THE MATTER OF SALT HYDROLYSIS IN CLASS XI SMAN 1 CERME GRESIK

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Abstrak: Penelitian ini bertujuan untuk mendeskripsikan penerapan pendekatan *brain based learning* yang dilihat dari (1) kemampuan guru mengelola kelas dengan menggunakan pendekatan *brain based learning*, (2) aktivitas siswa, (3) ketuntasan hasil belajar siswa, dan (4) respon siswa. Penelitian ini merupakan penelitian tindakan kelas dengan sasaran penelitian ini adalah siswa kelas XI IPA 1 SMA Negeri 1 Cerme Gresik tahun ajaran 2011-2012. Penelitian ini dilaksanakan sebanyak 3 kali putaran. Metode pengumpulan data yang digunakan adalah metode pengamatan, metode tes, dan metode angket. Hasil penelitian menunjukkan bahwa: (1) kualitas keterlaksanaan pendekatan *brain based learning* mendapat skor rata-rata padaputaran I sebesar 3,67 (baik), putaran II sebesar 4,25 (baik sekali), dan putaran III sebesar 4,58 (baik sekali). (2) Aktivitas siswa telah mencerminkan aktivitas pendekatan *brain based learning* seperti melakukan senam otak dan melakukan perayaan bersama, perilaku yang tidak relevan putaran I sebesar 5%, putaran II sebesar 1,67%, dan putaran III sebesar 1,11% (3) Hasil belajar siswa secara klasikal pada putaran I belum tercapai yakni sebesar 70%, namun pada putaran II dan III telah tercapai yaitu 83,33%, dan 90%. (4) Respon siswa terhadap pembelajaran menggunakan pendekatan *brain based learning* positif karena jawaban "ya" pada setiap pertanyaan lebih dari 61%.

Kata kunci: pendekatan *brain based learning*, hasil belajar, hidrolisis garam.

Abstract:*The aims of this research are to describe the implementation of brain based learning approach is seen from (1) the ability of teacher to manage situation in the class use brain based learning approach, (2) student activities, (3) Student learning achievement, and (4) student responses.This research is a class action with the target is a class of XI IPA 1 SMAN 1 Cerme Gresik 2011-2012 school year. The research was carried out 3 times a round or cycle. Data collection methods that used is test methods were the pretest and postest and the questionnaire method. The result showed that: (1) the ability of teacher to manage situation in the class use brain based learning approach had an average score of 3.67 on the round I (good) round II 4.25 (very good),and round III of 4.58 (very good), (2) Student activities have reflected activity of brain based learning approach as to brain gym and doing celebration together, the activity irrelevant in round I of 5%, round II of 1.67%, and round III of 1,11% (3) These results indicate that the student learning achievement in the classical style in the round I have not been achieved by 70%, but in rounds II and III has been achieved is 83.33%, and 90% (4) Student responses after learning brain based learning is positive because the answer "yes" to any question of more than 61%.*

Key words:*brain based learning approach, learning outcomes, salts hydrolysis.*

INTRODUCTION

The government established the importance of providing education of international standard, for both public and private schools.One of them held a pioneering International School (RSBI) (Depdiknas)[1]. The curriculum used in

RSBI Education is a blend Unit Level Curriculum (KTSP) as a national curriculum which is enriched with the Cambridge International Examination (CIE) as an International curriculum.

One of the subject in the curriculum are chemistry for a more specific purpose is to equip the students knowledge, understanding, and a number of skills required to enter higher education and to develop science and technology. The learning process is directed by KTSP aims to complete the process of student learning in accordance with the purpose of learning or study indicators that exist in the curriculum (Mulyasa)[2]. On a thorough study of a student who can learn a certain lesson unit can move to the next unit lesson if the student has been thoroughly mastered the appropriate minimum standard of thoroughness study determined by the school.

Based on interviews with a chemistry teacher at SMAN 1 Cerme Gresik is known that the completeness criteria Minimal (KKM) the individual is in school ≥ 75 whereas in the classical style by 75%. By KKM, there are still students whose value has not reached the KKM or said is still not fully in the learning of chemistry. One cause of why many students are bored in chemistry learning. They feel bored because learning to do less innovative, chemistry values obtained do not satisfy the students, and there are also students who have mastered the material before the material is taught. Of them that are causing students tend to talk to friends bench, daydreaming, so that teaching and learning activities are not optimal.

Based on the results of questionnaires of students taken on January, 10 2012 at SMAN 1 Cerme Gresik.As many as 56% of students consider difficult material salt hydrolysis. It was also confirmed by interviews with teachers of chemistry that the hydrolysis of the salt content was a lot of unfinished student in chemistry learning.

Based on the response of 27 students, 63% of students during the learning desire of a given innovation in teaching them the questions that challenge the ability to think. In addition 70% of students expect innovation group discussions interspersed with interesting games and interspersed with musical instruments, video playback can be motivating. Similarly, with 67% of students want an optimal activity, such as the eye used for reading and observing, moving the hand to write, the foot moves to follow the games in learning, active mouth to ask and discuss, and other productive activities such as brain gymnastics.

Based on the need to choose an approach that can adequately an interesting learning, in which also contains challenging questions that require students to think of using the brain to its full potential, and also allows students to be active in learning, between the approach is the brain based learning approach.

Teaching and learning process using brain-based learning approach tends to be full of excitement, challenge the students' ability to think, focus group discussions are interspersed with music and games so that learning becomes fun, active, and meaningful and self-motivated students (Sapaat)[3]. Does it improve the brain's ability to integrate the vast amount of information and engaging students in a learning process that simultaneously involves the intellect, creativity, emotions, and psychology. Students need these conditions the situation in the learning process (Jensen)[4] so that it can improve student learning result.

METHOD

The type of research is classroom action research.The object of this research is student in the class XI IPA 1 in the second semester of the school year 2011-2012 at SMAN 1 Cerme Gresik. The classroom action research by Arikunto[5] in each round consists of 4 stages: 1) Planning phase,

2) Activities phase, 3) Observations phase, and 4) Reflection phase. The research was carried out 3 times a round.

The ability of teacher to manage situation in the class obtained from observations using brain based learning approach is analyzed with the criteria that are used as follows:

Table 1 Specification Likert Scale Score

Score	Information
1	Once less
2	Less
3	Enough
4	Good
5	Very Good

Riduwan[6]

The formula is used:
Quality manage =

$$\frac{\text{total average score of criteria observation}}{\text{total of criteria observation}}$$

The calculation is done on every aspect of the overall assessment and evaluation aspects. The results obtained were divided as shown in the Table 2:

Table 2 Management of Learning

Score	Information
0,00 - 1,00	Once Less
1,01 - 2,00	Less
2,01 – 3,00	Enough
3,01 – 4,00	Good
4,01 – 5,00	Very Good

(Grinnell in Rozy, 2011) [7]

Student activities were analyzed to determine the activity of students during the learning process using brain-based learning approach using the formula:

Student Activity =

$$\frac{\Sigma frequency\ of\ activity\ \ appeared}{\Sigma Total frequency\ of\ activity} x100\%$$

Further analysis of test results showed the value of student learning obtained from students in a class that uses brain based learning. The minimum completeness criteria (KKM) at SMAN 1 Cerme Gresik is 75 and the classical style of 75%.

Data were analyzed by:

$$Nilai = \frac{B}{N} \times 100$$

Information

B = a lot of questions that are answered correctly items

N = number of grains of about

Exhaustiveness learning classes obtained by the formula:

$$\text{Exhaustiveness learning classes} = \frac{\sum \text{Exhaustiveness } students}{\sum students} \times 100\%$$

To analyze student responses using the questionnaire using the percentage of students who have chosen each alternative choice.

Values are presented as percentages were converted to the criteria in Table 3 below:

Table 3 Interpretation of Percentage of Student Responses

Percentage	Information
0% – 20%	Once Less
21% – 40%	Less
,41% - 60%	Enough
61% - 80%	Good
81% - 100%	Very Good

Riduwan[6]

Based on these criteria the student response is said to be positive if the percentage of ≥ 61%.

RESULTS AND DISCUSSION

At the time of learning using brain based learning approach on the matter of salt hydrolysis was observed teachers ability to manage situation in the class from round I, II, and III can be seen in Figure 1.

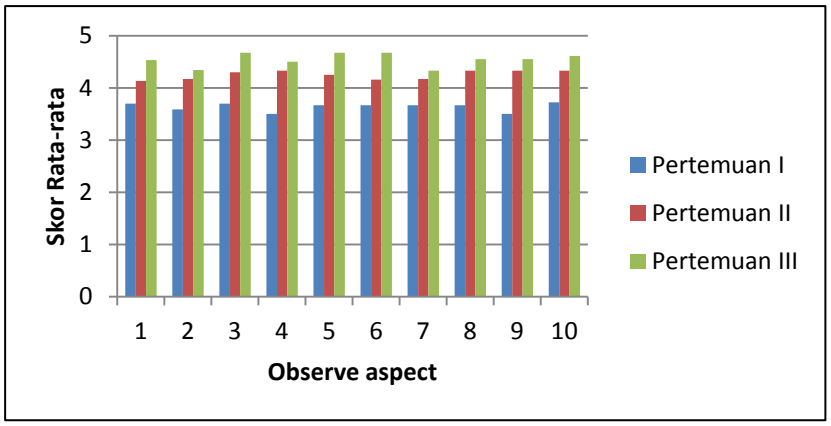

Figure 1 Graph Teacher Ability to Manage a Class.

Description:

1. Pre-exposure phase
2. The preparation phase
3. Initiation and Acquisition Phase
4. Elaboration phase
5. Incubation and insert the memory phase
6. Verification and checking of confidence phase
7. Celebrations and Integration Phase
8. Time management
9. Teacher questioning techniques
10. The class situation

Based on Figure 1 above is known in the round I, the observer provides an assessment of 3.70. In the second round of learning, observers gave an average rating of 4.13 and third round obtained score of 4.53. In this activity the teacher leads the brain gym. This increase is due to be teachers can lead and guide the students who initially do not know or could not do brain gym at all with the new movement and can be simulated perfectly well by the students. The condition when the brain gym becomes very exciting for the students so that learning begins when students are ready to follow lessons. According Ugart[8] Brain gym is a fun series of simple movements can balance all the parts of the brain. Light movements with the game through the hands and feet if it can provide a stimulus or stimulus to the brain. Movements that generate stimulus that can improve cognitive abilities, harmonize their activities and thinking skills at the same time, improve balance or harmony between emotion and logic control, optimizing the performance of sensory function, maintain flexibility and balance the body.

Initiation and the acquisition phase of the round I get anscore of the observer by an average of 3.70, 4.30 for round II, and 4.67 for rounds III. At this stage do experiment, then students to discuss the results with a group, teacher playing musical instrument at low volume, but all students can still hear it, this is to create an atmosphere of quiet and calm in order to concentrate more students to do worksheets and discussion experiment results. As stated by Jensen [4] music can enrich the learning environment by calming the nervous systems, and music can also improve memory, cognition, concentration, and creativity. Just by playing music with low volume may create conditions for a relaxed and optimal learning.

In the incubation and put the memory phase on the round I get an average rating of 3.67, 4.25 for round II and 4.67 for round III. Students seem very excited to watch a short video and highly motivated students who are served by the teacher. After the student's mind refreshed, students are given the questions of understanding by the teacher to do without the guidance of a teacher and musical instruments played back by the teacher. According to Jensen [4] a strategy for managing a

productive learning among students activity with direct facilitate stretching sessions or games that are encouraging, showing a video that can motivate students, to create energy change by changing seats or provide different colors.

Celebration and integration phase of the round I get an average rating of 3.75, 4.17 for rounds II and rounds III of 4.33. Teachers with students doing the celebration by cheering and clapping along together because it has completed the study. According to Jensen [4] can add elements to celebrate the joy and emotion involved as learners in the learning takes place.

Whole of rounds I, II, and III study usingbrain based learning approach made by teachers in classroom management to increase. In the round I get an average value of 3.67 with either category, round II have an average value of 4.25 with either category III round once and get an average value of 4.58 with the excellent category.

On observations of student learning activities using brain based learning approach to the observations obtained during three rounds of activity can be seen in Figure 2 below:

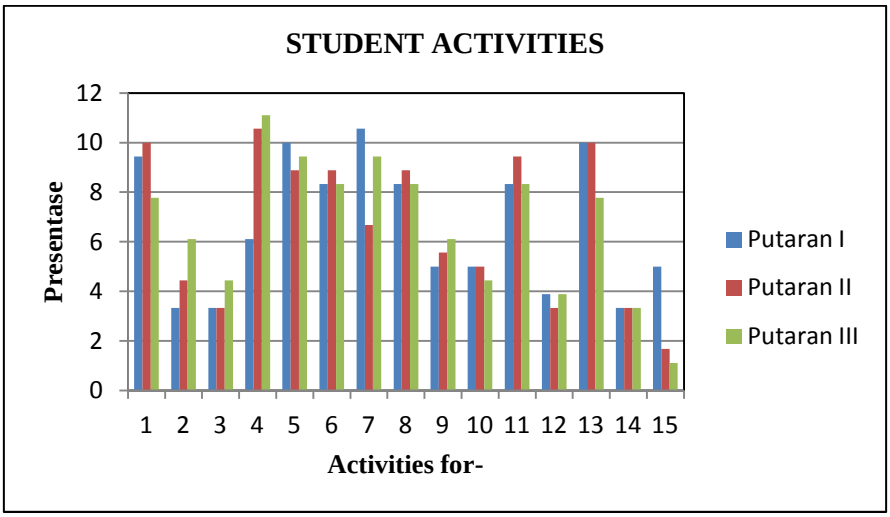

Figure 2 Graph of Student Activities

Description:

1. Students work on the problems of pre-test
2. Students consider the concept map displayed by the teacher.
3. Students listen / pay attention to the teacher presents the objectives of learning.
4. Students follow the gymnastics of the brain (brain gym).
5. Students perform experiment with group members.
6. Students discuss with their group members.
7. Students work on exercises in LKS.
8. Students discuss the matter in LKS.
9. Students pay attention, expressing opinions or asking questions.
10. Students ask questions about the material that has not been understood
11. Students pay attention to the video that was played by the teacher.
12. Students draw a conclusion that the material has been studied.
13. Students working on the evaluation (post-test) and the students completed a questionnaire response.
14. Students do a small celebration, as cheering and clapping along.
15. Irrelevant behavior (joking, take a walk, drowsiness, sleeping, etc..).

The students activity in learning that shows brain based learning activity, teacher doing brain gym on the round I get a percentage of the student activity at 6.11% in this case the students are very enthusiastic to follow brain gym along with the teacher, although they are difficult to follow movement exemplified by the teacher but the students still trying to follow. Students are very happy and the classroom atmosphere becomes not stiff and comfortable for learning, round II by 10.56% because brain gym carried out with 6 movements compared rounds I have only 3 movement.So need more time for students to doing brain gym activity.In the third round get a percentage score of 11.11% due to the teacher demonstrated additional new movement that students need to adapt again and teacher repeat several times so that students can follow the movements of the brain gym by enjoy. According Ugart[4] Brain gym is a fun series of simple movements can balance all the parts of the brain. Light movements with the game through the hands and feet if it can provide a stimulus or stimulus to the brain. Movements that generate stimulus that can improve cognitive abilities, harmonize their activities and thinking skills at the same time, improve balance or harmony between emotion and logic control, optimizing the performance of sensory function, maintain flexibility and balance the body.

Students do a small celebration activities, such as cheering and clapping along to get a percentage of 3.33%, due to be done only once in the course of learning and that too at the end of learning. All students come to cheer and joy of learning together because it was completed in round I, II, and III. According to Jensen [4]the celebration can add elements to joy and emotion involved as learners in the learning takes place.

In the round I found that the behavior irrelevant in the learning rate of 5% among others such as drowsiness, day dreaming, joking with his friend.This is because the learning takes place when the electrical power was broken, so the learning disrupted. In the second round of 1.67% and 1.11% for third round because students were beginning to get used to using brain-based learning approach and is very enthusiastic in participating in learning and interested students to consider any explanation given by the teacher.

At the time of learning using brain based learning approach to the material salt hydrolysis through the students' pretest and posttest, which conducted the pretest at the beginning of learning and posttest at the end of the lesson. Student learning outcomes can be seen in Figure 3 below.

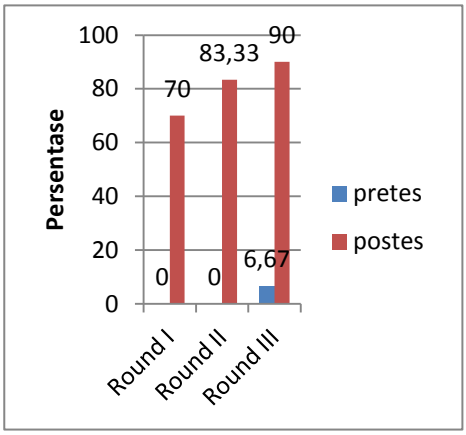

Figure 3 Graph of Student Learning Outcomes.

From Figure 3 it can be seen that the learning result of the 30 students in the round I seen from the results of the pretest value is obtained that all students below the Minimum Completeness Criteria so that the classical thoroughness pretest round I at 0%.Pretest results are not optimal due to little of knowledge is the beginning student to the concepts of salt hydrolysis and the possibility of students have never study salt hydrolysis content before.At the posttest as many as 21 students so that they are above the

Minimum Completeness Criteria obtained in the classical completeness posttest in round I of 70%. Students who have not obtained the Minimum Completeness Criteria or in other words the domain of cognitive learning outcomes is still little, may not concentrating, not yet fully understand the material, still not adapted to learning using brain based learning is used by teachers, and do not have the preparation to learn, such as the Slameto[9] expressed the readiness or preparation of students in the learning process should be because if students have learned and preparedness, it would be better learning outcomes.

The teaching and learning activities in second round of carried out in accordance with the reflection of the previous round in order to obtain better learning outcomes than the previous round. From Figure 3 it can be seen that the results of the pretest value is obtained that all students under the classical Minimum Completeness Criteria so exhaustiveness of the pretest to the second round of 0%. Same with the round I, the pretest results are not optimal due to little of knowledge is the beginning student to the concepts of salt hydrolysis and the possibility of students have never study salt hydrolysis content before. At the posttest as many as 25 students so that they are above the Minimum Completeness Criteria obtained in the classical completeness posttest in round II of 83.33%. When compared with the round I, in the classical completeness of student learning has increased significantly and has met the established classical school thoroughness which is 75%.

The teaching and learning activities in third round carried out in accordance with the reflection of the previous round in order to obtain better learning outcomes than the previous round. Figure 4 of the pretest results can be seen that there are two students whose values satisfy the classical Minimum Completeness Criteria so the thoroughness of the pretest on the third round of 6.67%. There are students who score above the Minimum Completeness Criteria presumably because at the previous meeting of the second round, students were told to learn the material subsequent to the third round with the same phase so that the students had anticipated a way to learn the material before the third round learning begins. It may also the pretest results that achieve Minimum Completeness Criteria is alleged to have had a good knowledge about the material being teach. Thus, students will acquire the relationship between of knowledge of him with the subjects belonged to him of the decision. It can help students to pay attention to the lesson better (Slameto)[9]. Based posttest result as many as 28 students who completed or they are above the Minimum Completeness Criteria so obtained in the classical completeness posttest third round by 90%.

So it can be seen that the thoroughness of student learning in the classical style of rounds I, II, and III is experiencing an increase in each round means learning to use brain-based learning can improve student learning outcomes.

Level of cognitive learning result are more optimal in the overall student learning can occur due to using brain-based learning gives students the opportunity to separately obtain a relaxed learning but still concentration. Brain based learning provides opportunities to students as learners, stimulated through active learning process that they do own (Sapa'at)[3]. Emphasis on teacher centered learning. Students are placed as the object of learning, students listen to the teacher's explanations in an orderly manner, expressing opinions, suggestions or questions. According to Jensen[4] learners who live in stress, anxiety, or threat is constantly getting the rest of the brain that is essential to make optimal brain functioning, would have a devastating impact that learning and thinking will be disrupted. As disclosed Slameto[9] to choose how to learn the

proper and adequate rest will improve learning result.In addition, the learning outcomes would be best if students have learned the attention to materials that do not arise boredom (Slameto)[9].

The student responses to brain-based learning obtained from a questionnaire sheet given to students learning at the end of each round, so we get an average student responses ranging from round I, II, and III are shown in figure 4 below.

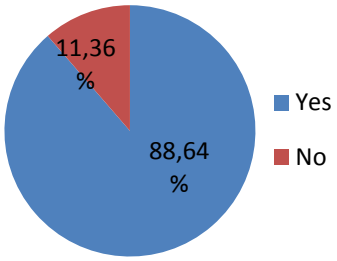

Figure 4 Graph of the average student response during the rounds I, II, and III

Based on figure 4 note that the average of the round I, round II, and III round of student responses to the implementation of brain based learning et the percentage of the average response of 88.64% or more than 61% answered "yes" so that learning using brain based learning is getting a positive response from students.

CONCLUSION

Based on the discussion can be concluded that the ability of teacher to manage situation in the class use brain based learning approach had an average score of 3.67 on the round I (good), round II 4.25 (very good), and round III of 4.58 (very good) while student activities have reflected brainbased learning approach activity as doing brain gym and conduct joint celebration, the activity is not relevant in round I of 5%, round II of 1.67%, and round III of 1,11%. The classical completenes of student learning result in round I of 70% which indicates that the student has not reached completeness in the classical style that defined the 75%. In the round II and round III of the classical completeness is achieved with a percentage of 83.33% and 90%. This suggests that the result of student learning in the classical style has increased in each round. While the student response to learning that uses brain based learning approach to the material response of salt hydrolysis is greater than 61%, so it can be said of learning using brain based learning had a positive response from students.

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